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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SALMON, KATHERINE D	
ART UNIT	PAPER NUMBER
1634	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/718,391	ENGELHARDT ET AL.	
	Examiner	Art Unit	
	KATHERINE SALMON	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *91-103* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *91-103* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/13/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to papers filed 4/21/2008.

2. Currently Claims 91-103 are pending.

3. The following rejections for Claims 91-103 are newly applied. Response to arguments follows.

4. This action is Non-FINAL.

Priority

5. It is noted that priority has been granted in the petition decision mailed 1/23/2008. As such the filing date is 01/13/1994.

Withdrawn Objections and Rejections

6. The objection to the abstract made in the nonfinal (6/02/2006) in section 4 is moot based upon amendments to the specification.

7. The objection to the specification made in the non-final (6/02/2006) in section 5 is moot based upon amendments to the specification.

8. The objection to the claims made in the non-final (6/02/2006) in section 6 is moot based upon amendments to the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. It is noted that the following 35 USC 103(a) rejections are newly applied.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 91-95 and 98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schuster et al. (US Patent 5,169,766 December 8, 1992) in view of Scheele (US Patent 5162209 November 10, 1992).

12. Schuster et al. teaches a method of amplifying a nucleic acid molecule. With regard to Claim 91, Schuster et al. teaches providing a DNA target and mixing the target with nucleoside triphosphates (Figure 1 Column 7, lines 60-65). Schuster et al. teaches the use of primers which are chemically modified by blocking the 3' terminus using a 3' terminal nucleotide lacking a 3' hydroxyl group (Column 11 lines 60-64). Schuster et al. teaches conditions or agents (nucleic acid producing catalysts) which increase amplification are present (Column 7, lines 50-55). Schuster et al. teaches that the assay mixture has a sufficient quantity of cofactors to support the degree of amplification desired (Column 7, lines 60-65). Schuster et al. teaches isostatic conditions, such as, the use of Tris base (pH stabilizer) in the amplification reactions, stable temperature of 37°C for 3 hours, and with a specific number of molecules of RNA (Column 13, lines 40-52). With regard to Claims 92 and 93, Schuster et al. teaches the use of Rnase H to remove RNA from the cDNA (Column 8, lines 7-10). Schuster et al. teaches an mRNA promoter (primer) which is used to extend and make ssRNA (Figure 3). Schuster et al. teaches another primer (DNA) is annealed to the ssRNA and cDNA is copied (Figure 3). Schuster et al. teaches the ssRNA (which is the extended promoter) is destroyed by Rnase H. Further, any primers which are in the solution but did not primer to the original ssDNA would be destroyed by Rnase H, therefore allowing for a reaction solution with only the cDNA that allows the completion of another cycle and the production of another cDNA strand identical to the ssDNA template. With regard to Claim 94, Schuster et al. teaches the primers can be DNA or RNA (Column 5 lines 35-38 and 55-60). With regard to Claim 95, Schuster et al. teaches the use of

primers which are chemically modified by blocking the 3' terminus using a 3' terminal nucleotide lacking a 3' hydroxyl group (Column 11 lines 60-64). With regard to Claim 98, Schuster et al. teaches a promoter (primer) in which at least 1 nucleotide is noncomplementary (Fig 2 5th step).

However, though Schuster et al. teaches that the primer can be RNA (Column 11, lines 47-51), Schuster et al. does not teach that all of the primer sequences from the products are removed so that a primer binding site is regenerated on a specific nucleic acid allowing a new priming event to occur.

Scheele et al. teaches a method for preparing a dsDNA from an ssDNA (abstract). Scheele et al. teaches a method of providing a first DNA strand, contacting with a primer, synthesizing in the presence of the primer that contains RNA and producing a copy of the DNA template (abstract). Scheele et al. teaches that RNA primers can be digested using RNAse H (Column 6 lines 65-68). Therefore the RNA primers will be removed and the primer binding site is regenerated and as such all of the primer sequences from the products are removed so that a primer binding site is regenerated on a specific nucleic acid allowing a new priming event to occur.

Therefore it would be prima facie obvious to one of ordinary skill in the art to digest the RNA primer of Schuster et al. with the RNAse H which is already in the solution because Scheele et al. teaches that RNAse H digest RNA primers on a DNA/RNA hybrid strand. The ordinary artisan would be motivated to digest all RNA which is in the system in the double stranded form (e.g. DNA/RNA) in order to produce multiple copies of the nucleic acids of interest. Scheele et al. teaches that RNA primers

can be digested using RNAse H (Column 6 lines 65-68). Therefore the RNA primers will be removed and the primer binding site is regenerated and as such all of the primer sequences from the products are removed so that a primer binding site is regenerated on a specific nucleic acid allowing a new priming event to occur.

Response to Arguments

The reply traverses the rejection. A summary of the arguments made in the reply is presented below with response to arguments following.

The reply asserts that Schuster does not teach step d of Claim 91 (p. 20 1st paragraph). The reply asserts that in the instant invention the substrate is an extended primer bound to the nucleic acid of interest and thus when the RNA segment of the primer is removed a binding site is regenerated on the nucleic acid of interest (p. 20 1st paragraph).

These arguments have been fully reviewed but have not been found persuasive.

It is noted that the claims do not require a step wherein the primers are RNA However, Schuster et al. teaches that the protoprimer can be composed of RNA (Column 11, lines 47-51). Schuster et al. teaches the addition of RNase H. Scheele et al. teaches that RNA primers can be digested using RNAse H (Column 6 lines 65-68). Therefore in the case of the proto-primer comprising RNA, the RNA would be digested and the primer binding site would be open for further replication. Further the limitation

that the same primer binding events occur with the original template is not a limitation of the claims. The claims are drawn to “allowing another primer binding event to occur with said nucleic acid of interest”. Therefore the "another primer binding event” could be a primer binding event in another region of the template. Said nucleic acid of interest could refer to the original template, but since the produced nucleic acid is identical to the original template could refer to the produced nucleic acid. As discussed above, Schuster et al. teaches that the protoprimer can be composed of RNA (Column 11, lines 47-51). Schuster et al. teaches the addition of RNase H. Scheele et al. teaches that RNA primers can be digested using RNAse H (Column 6 lines 65-68). Therefore in the case of the proto-primer comprising RNA, the RNA would be digested and the primer binding site would be open for further replication. Therefore the RNA segment of the primers would be digested with RNase H and as such only the sense strange of the original RNA analyte will be in the system (Figure 4).

13. Claims 91-98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kacian et al. (US Patent 5554516 September 10,1996) in view of Scheele (US Patent 5162209 November 10, 1992).

Kacian et al. teaches a method of amplifying a target nucleic acid sequence (Abstract). With regard to Claim 91, Kacian et al. teaches a method of incubating a promoter-primer and a target sequence in DNA priming and nucleic acid synthesizing conditions (ribonucleotide triphosphates and deoxyribonucleotide triphosphates) for a period of time to many multiple copies of the target sequence (Column 10 lines 23-33).

Kacian et al. teaches using a DNA polymerase (nucleic acid producing catalyst) (Column 10 line 59). Kacian et al. teaches that the reaction takes place under conditions that are substantially isothermal and include substantially constant ionic strength and pH, i.e. isostatic conditions (Column 10 lines 37-45).

With regard to Claims 92-93, Kacian et al. teaches that generation of target sequence is done using Rnase H (Column 4 lines 65-67 and Column 5 lines 1-5). Kacian et al. teaches the promoter-primer may be altered with ribonucleotides (Column 9, line 15). Therefore Kacian et al. teaches a reaction in which Rnase H is in the presence of a RNA-DNA hybrid (DNA target with a promoter with ribonucleotides), it is inherent that the Rnase H will denature the ribonucleotide promoter and thereby release the DNA target from the promoter.

With regard to Claim 94, Kacian et al. teaches the use of DNA as a primer sequence (Column 6 lines 18-25). Kacian et al. teaches that this sequence may have modifications such as dideoxynucleotide residues that have been modified such as phosphorothioates (chemically) (Column 9, lines 14-16).

With regard to Claim 95, Kacian et al. teaches the 3' end of the promoter-primer may be modified (Column 7, line 6). With regard to Claim 96, Kacian et al. teaches that one modification can be the addition of a phosphorothioate (sulphur heteroatom) (Column 9 lines 17).

With regard to Claim 97, Kacian et al. teaches that promoter-primer can include the addition of 3'2' dideoxynucleotide residues modified with phosphorothioates (Column 9

lines 15-17). With regard to Claim 98, Kacian et al. teaches a promoter primer which has at least one nucleotide that is noncomplementary (Figure 1).

However, though Kacian et al. does not teach all of the primer sequences from the products are removed so that a primer binding site is regenerated on a specific nucleic acid allowing a new priming event to occur.

Scheele et al. teaches a method for preparing a dsDNA from an ssDNA (abstract). Scheele et al. teaches a method of providing a first DNA strand, contacting with a primer, synthesizing in the presence of the primer that contains RNA and producing a copy of the DNA template (abstract). . Scheele et al. teaches that RNA primers can be digested using RNAse H (Column 6 lines 65-68). Therefore the RNA primers will be removed and the primer binding site is regenerated and as such all of the primer sequences from the products are removed so that a primer binding site is regenerated on a specific nucleic acid allowing a new priming event to occur.

Therefore it would be prima facie obvious to one of ordinary skill in the art to digest the RNA primer of Kacian et al. with the RNAse H which is already in the solution because Scheele et al. teaches that RNAse H digest RNA primers on a DNA/RNA hybrid strand. The ordinary artisan would be motivated to digest all RNA which is in the system in the double stranded form (e.g. DNA/RNA) in order to produce multiple copies of the nucleic acids of interest. Scheele et al. teaches that RNA primers can be digested using RNAse H (Column 6 lines 65-68). Therefore the RNA primers will be removed and the primer binding site is regenerated and as such all of the primer sequences from

the products are removed so that a primer binding site is regenerated on a specific nucleic acid allowing a new priming event to occur.

Response to Arguments

The reply traverses the rejection. A summary of the arguments made in the reply is presented below with response to arguments following.

The reply asserts that Kacian does not teach step d of Claim 91 (p. 21 1st full paragraph). The reply asserts that in the instant invention the substrate is an extended primer bound to the nucleic acid of interest and thus when the RNA segment of the primer is removed a binding site is regenerated on the nucleic acid of interest (p. 21 1st full paragraph).

These arguments have been fully reviewed but have not been found persuasive.

It is noted that the claims are not limited to primers comprising RNA. It is acknowledged that RNaseH requires the presence of an RNA/DNA template and will not act on a single stranded RNA sequence. However, Scheele et al. teaches that RNA primers can be digested using RNAse H (Column 6 lines 65-68). Therefore in the case of the proto-primer comprising RNA, the RNA would be digested and the primer binding site would be open for further replication. Further the limitation that the same primer binding events occur with the original template is not a limitation of the claims. The claims are drawn to "allowing another primer binding event to occur with said nucleic

acid of interest". Therefore the "another primer binding event" could be a primer binding event in another region of the template. Said nucleic acid of interest could refer to the original template, but since the produced nucleic acid is identical to the original template could refer to the produced nucleic acid. Therefore in the case of the proto-primer comprising RNA, the RNA would be digested and the primer binding site would be open for further replication. Therefore the RNA segment of the primers would be digested with RNase H and as such only the sense strand of the original RNA analyte will be in the system (Figure 4).

14. Claims 96-97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schuster et al. (US Patent 5,169,766 December 8, 1992) in view of Scheele (US Patent 5162209 November 10, 1992) as applied to Claims 91-95 and 98 in view of Skerra (Nucleic Acids Research 1992 Vol. 20 p. 3551).

Schuster et al. and Scheele et al., however, do not teach primers modified by heteroatoms comprised of nitrogen or sulfur and chemically modified primers comprised of nucleoside triphosphates.

Skerra teaches a method of using phosphorothioate primers in an amplification method (Abstract). With regard to Claims 96-97, Skerra teaches the modification of primers by the addition of a single phosphorothioate bond (heteroatom of sulfur) at the first 3' terminal internucleotide linkage during synthesis of the oligodexoynucleotide (p. 3552 1st column last paragraph). Skerra teaches that the phosphorothiate bond is much

less favored substrate to nuclease activity than the naturally occurring phosphodiester bond (P. 3552 1st column last sentence and 2nd column 1st sentence).

Therefore it would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Schuster et al. and Scheele, to use the phosphorothioate primers as taught by Skerra. The ordinary artisan would have been motivated to modify the method of Schuster et al and Scheele, because Skerra teaches the use of phosphorothiate primers would avoid the lower PCR yield and non-specific side products resulting from 3' terminal editing of the primer molecule by protecting the oligodeoxynucleotide from a 3' terminal exonuleoytic attack (p. 3553 2nd column last paragraph).

Response to Arguments

The reply traverses the rejection. A summary of the arguments presented in the reply is summarized below with response to arguments following.

(A) The reply asserts that Schuster et al. is directed to amplification whereas Skerra is directed to oligonucleotide analysis (p. 23 1st full paragraph). The reply asserts there is no suggestion regarding the use of analogs in the amplification method of Schuster (p. 23 1st full paragraph).

These arguments have been fully reviewed but are not found persuasive.

However, the combination of Schuster et al., Scheele et al., and Skerra et al. teach the claimed limitations. Further Scheele et al. is drawn to a method of using phosphorothioate primers in an amplification method (Abstract). Therefore both

Schuster et al. and Scheele et al. use primers to produce multiple strands of identical nucleic acid template. Skerra teaches the use of phosphorothiate primers would avoid non-specific side products resulting from 3' terminal editing of the primer molecule by protecting the oligodeoxynucleotide from a 3' terminal exonuleoytic attack (p. 3553 2nd column last paragraph). Therefore it would be obvious to use in the amplification method of Schuster et al. and Scheele et al. because the phosphorothiate primers would avoid the production of non-specific side products and increase amplification yield.

(B) The reply asserts that Schuster et al. does not teach step d (p. 23 2nd paragraph).

This has been fully reviewed but has not been found persuasive.

As discussed above although Schuster et al. does not teach the limitations of step d, the combination of Schuster et al. and Scheele et al. teach all the limitation of Claim 91.

15. Claims 99-103 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schuster et al. (US Patent 5,169,766 December 8, 1992) in view of Scheele (US Patent 5162209 November 10, 1992) as applied to Claims 91-95 and 98 in view of Cerretti et al. (US Patent 5,317,087 May 31, 1994).

Schuster et al. and Scheele et al., however, does not teach primer hybridization in which at least one loop structure is formed.

Cerretti et al. teaches that a library of cDNA can be prepared by using hairpin loop primers (Column 11 lines 10-26). Cerretti et al. teaches the mRNA primer is hybridized to a first cDNA strand (Column 11 lines 10-26). Cerretti et al. teaches that this results in a "hairpin" loop at the 3' end of the initial cDNA strand that serves as an integral primer for the second DNA strand (Column 11 lines 10-26). Cerretti et al. teaches that the second cDNA strand is synthesized using a DNA polymerase and the hairpin loop is cleaved to produce double stranded cDNA molecules (Column 11 lines 10-26).

Therefore it would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Schuster et al. and Scheele et al. to use the hairpin loop primer as taught by Cerretti et al. The ordinary artisan would have been motivated to modify the method of Schuster et al. and Scheele et al. because Cerretti et al. teaches a method of using hairpin loops to copy small cDNA fractions from a large cDNA template (Column 11 lines 10-26). The ordinary artisan would want to use hairpin loops as a way to prepare a library of double-stranded cDNA and would want to cleave the mRNA primer from the target cDNA in order to keep using the original long strand of cDNA. The ordinary artisan would therefore be able to produce multiple copies at multiple positions of the target cDNA strand by annealing a mRNA primer, copying a fragment of cDNA with a hairpin loop, removing the mRNA primer, and adding another mRNA primer somewhere else on the target DNA.

Response to Arguments

The reply traverses the rejection. A summary of the rejection is set forth below with response to arguments following. The reply asserts that the hairpin loop in Ceretti is annealed only on the stem portion and therefore the stem portion will remain intact and bound to the template and it is only the loop portion that is digested (p. 25 1st-3rd paragraph).

These arguments have been fully reviewed but have not been found persuasive.

It is noted that the claims are not limited to annealing of the hairpin primer in a particular location to the target. Further, Schuster teaches that the primer can be RNA. Scheele et al. teaches that RNA primers can be digested using RNAse H (Column 6 lines 65-68). Therefore in the case of the proto-primer comprising RNA, the RNA would be digested and the primer binding site would be open for further replication. Further the limitation that the same primer binding events occur with the original template is not a limitation of the claims. The claims are drawn to “allowing another primer binding event to occur with said nucleic acid of interest”. Therefore the "another primer binding event” could be a primer binding event in another region of the template. Said nucleic acid of interest could refer to the original template, but since the produced nucleic acid is identical to the original template could refer to the produced nucleic acid. Therefore in the case of the proto-primer comprising RNA, the RNA would be digested and the primer binding site would be open for further replication. Therefore the RNA segment of the primers would be digested with RNase H and as such only the sense strand of the original RNA analyte will be in the system (Figure 4).

Double Patent

16. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

17. Claims 91-103 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 112-148 of copending Application No. 10/713183. Although the conflicting claims are not identical, they are not patentably distinct from each other because Claim 91-103 of the instant application describes the same method steps as Claim 112-148 of application 10/713183. Both applications are drawn to a method of producing copies of a specific nucleic acid by providing a nucleic acid sample, contacting it with unmodified nucleic acid precursors

and modified RNA primers. Both applications use a catalyst. Both applications modify primers using hereoatoms comprising nitrogen or sulfur. Both applications claims are drawn to primers, which comprise about 1 to about 200 noncomplementary nucleotide or nucleotide analogs.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

The reply did not present any arguments to traverse the double patent rejection presented above.

Conclusion

18. No claims are allowable over the cited prior art.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine Salmon whose telephone number is (571) 272-3316. The examiner can normally be reached on Monday-Friday 8AM-430PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Katherine Salmon
Examiner
Art Unit 1634

/Ram R. Shukla/

Supervisory Patent Examiner, Art Unit 1634